Examination of abortion experience in Georgia, following the passage of a liberalized law on pregnancy termination, leads to the conclusion that expectations of increased availability of safe hospital abortions and reduced morbidity and mortality were not fulfilled. Factors affecting this situation are discussed, and the need for services other than abortion alone are indicated.

AN EPIDEMIOLOGICAL ANALYSIS OF ABORTION IN GEORGIA

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Introduction

ON April 12, 1968, the Georgia legislature passed an abortion law[1] based on the American Law Institute's Model Penal Code. According to some proponents, this was intended to increase the availability of safe, hospital abortions and to reduce the morbidity and mortality of nonhospital abortions. One might have expected hospital abortions to become as readily available in Georgia as in other states with similar laws. Examining nonhospital abortion mortality trends for 1950-1969 and hospital abortion data for April, 1968, to June, 1970, we find that these expectations were not fulfilled during the first two years following passage of the law.

Epidemiology of Nonhospital Abortion Deaths

Although nonhospital abortion deaths are underreported, they provide a convenient parameter for measuring the unfavorable consequences of nonhospital abortions. Between 1950 and 1969, nonhospital abortions caused the deaths of 205 residents of 55 of Georgia's 159 counties. Table 1 presents data on abortion and maternal mortality in Georgia during this 20-year period.

While maternal mortality in Georgia declined 67 per cent for both whites and blacks, abortion mortality declined 86 per cent for whites and 46 per cent for blacks between the first and last five-year periods. Of the 205 nonhospital abortion deaths which occurred between 1950 and 1969, 143 or 69 per cent were of black women. Of the 25 women who died as a consequence of abortion in the last five years, 22 or 88 per cent were black.

Maternal and abortion mortality was higher in Georgia than in the USA in the period from 1950 to 1965. As can be seen in Table 2, maternal mortality remained higher in Georgia than in the USA between 1965-1969, but abortion mortality in Georgia was lower. While white abortion mortality in Georgia declined 80 per cent, black abortion mortality declined by only 33 per cent between the last two five-year periods. Although black abortion mortality in the state was four times greater than white abortion mortality between 1960-1964, it was 14 times greater between 1965-

Table 1—Maternal and abortion mortality by ethnic group, Georgia, 1950-1969

Ethnic group and year	Deaths		Ratio*		% maternal deaths due to abortion
	Total Maternal	Abortion	Total Maternal	Abortion	
All					
1950–1954	643	67	13.3	1.4	*10*
1955–1959	409	58	8.1	1.2	*14*
1960–1964	270	56	5.4	1.1	*21*
1965–1969	177	25	4.0	0.6	*14*
White					
1950–1954	207	21	6.8	0.7	*10*
1955–1959	130	21	4.0	0.6	*16*
1960–1964	90	17	2.8	0.5	*19*
1965–1969	63	3	2.1	0.1	*5*
Black					
1950–1954	436	46	24.5	2.6	*11*
1955–1959	279	37	15.4	2.0	*13*
1960–1964	180	39	10.2	2.2	*22*
1965–1969	114	22	7.5	1.4	*19*

* Deaths per 10,000 live births.

1969. Abortion mortality from nonhospital abortions in Georgia is becoming increasingly a black health problem; presumably, this reflects the lower socioeconomic status of blacks in Georgia.

Figure 1 shows the annual fluctuation in abortion mortality for both black and white ethnic groups. The annual peaks in mortality for black women in 1959 and 1964 and for white women in 1963-1964 represent women dying in widely separated counties in different months of the year. This lack of geographic and temporal clustering of deaths militates against the possibility that these annual peaks might represent epidemics, initiated by individual abortionists or abortion rings. Since we have no information about the motivation that leads to nonhospital abortions, we do not know if there was an increase in some common motivating force during those years.

The age distribution of women dying

Table 2—Maternal and abortion mortality* by ethnic group, USA and Georgia, 1950-1969

Ethnic group and year	USA†		Georgia	
	Total	Abortion	Total	Abortion
All				
1950–1954	6.8	0.8	13.3	1.4
1955–1959	4.1	0.6	8.1	1.2
1960–1964	3.6	0.7	5.4	1.1
1965–1969	3.0	0.5	4.0	0.6
White				
1950–1954	4.9	0.5	6.8	0.7
1955–1959	2.8	0.4	4.0	0.6
1960–1964	2.4	0.4	2.8	0.5
1965–1969	2.0	0.3	2.1	0.1
Black				
1950–1954	18.3	2.4	24.5	2.6
1955–1959	11.2	1.9	15.4	2.0
1960–1964	9.6	2.0	10.2	2.2
1965–1969	7.5	1.7	7.5	1.4

* Deaths per 10,000 live births.
† USA data available through 1967 only.

Figure 1—Nonhospital abortion deaths, by ethnic group, Georgia, 1950-1969

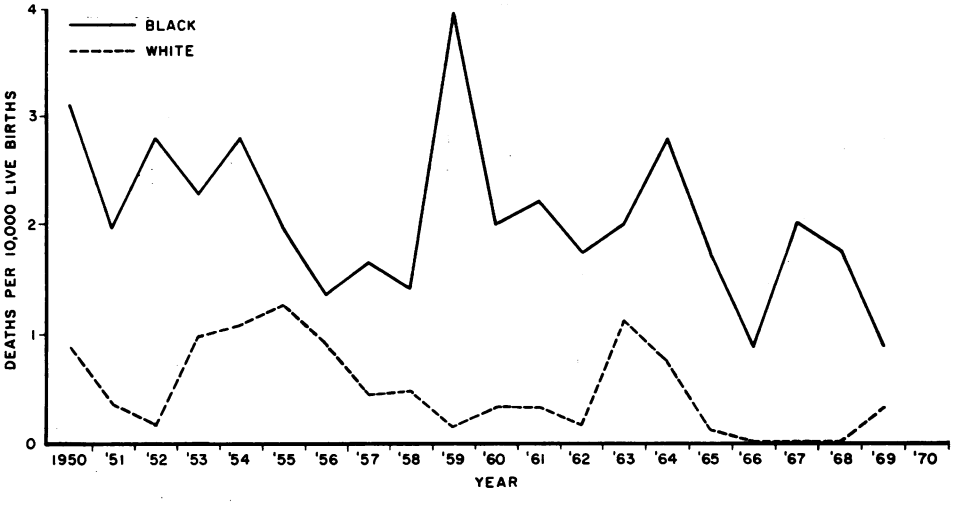


Table 3—Abortion mortality by age and ethnic group, Georgia, 1955-1969

Age	Deaths		Ratio per 10,000 live births	
	White	Black	White	Black
15–19	2	14	0.1	1.1
20–24	10	25	0.3	1.6
25–29	10	20	0.4	2.0
30–34	9	19	0.8	2.9
35–39	6	15	1.1	4.0
40 and over	4	4	2.6	3.2
Unknown	0	1	0.0	0.1
Total	41	97	0.4	1.9
Median age	29.3	27.4		

from nonhospital abortions between 1955 and 1969 is shown in Table 3. Although the largest number of abortion deaths occurred in women age 20-34, the risk of a pregnant woman dying from nonhospital abortion increases steadily with age for both whites and blacks. For each age group the risk of death is greater for blacks. This difference is most striking for the teen-age group; pregnant black teenagers are 11 times more likely to die from nonhospital abortions than pregnant white teenagers.

Analyzing reported nonhospital abortion deaths by ethnic group and marital status (Table 4), we find that abortion mortality has not been a problem for unmarried white women; it is becoming less of a problem for married white women; and it has also declined for married black women. Only among unmarried black women has the number of abortion deaths not declined.

If we examine the ratio of nonhospital abortion deaths per 10,000 live

Table 4—Abortion deaths by ethnic group and marital status,* Georgia, 1955-1969

Yr	Deaths					
	Total		White		Black	
	M	S	M	S	M	S
1955–1959	46	12	21	0	25	12
1960–1964	43	13	16	1	27	12
1965–1969	12	13	3	0	9	13

* Single includes never married, separated, divorced, widowed.

births for each group of women (Table 5), we find that unmarried black women have had the highest mortality in each five-year period. They are the only group showing no decline in abortion mortality during the past 15 years.

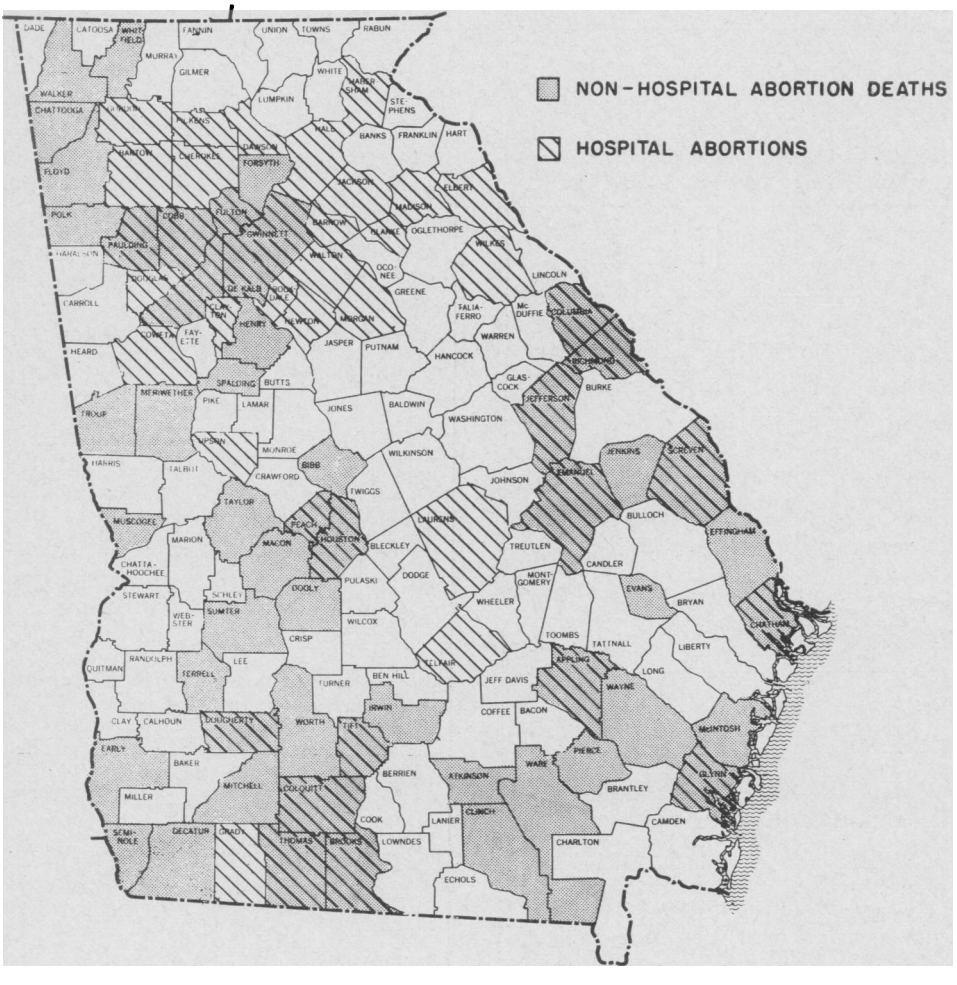
The 55 widely distributed shaded counties in the map of Georgia in Figure 2 are the counties of residence of the women who died from nonhospital abortions between 1955 and 1969. During each of the three five-year periods—

Table 5—Abortion mortality by ethnic group and marital status,* Georgia, 1955-1969

	Deaths per 10,000 live births					
	Total		White		Black	
Yr	M	S	M	S	M	S
1955–1959	1.0	2.4	0.7	0.0	1.8	2.7
1960–1964	1.0	2.6	0.5	1.6	2.0	2.8
1965–1969	0.3	2.6	0.1	0.0	0.8	3.1

* Single includes never married, separated, divorced, widowed.

Figure 2—Nonhospital abortion deaths 1955-1969 and hospital abortions* 1968-1970, by county of residence, Georgia



* Hospital abortions were legalized April 12, 1968; this map includes hospital abortions reported through June 30, 1970.

Table 6—Abortion deaths by place of residence, Georgia and Metropolitan Atlanta, 1955-1969

Yr	Deaths		
	Georgia	Atlanta	%
1955–1959	58	11	*19*
1960–1964	56	10	*18*
1965–1969	25	8	*32*

1955-1959; 1960-1964; and 1965-1969 —38, 30, and 14 counties, respectively, were reported as counties of residence of women dying from nonhospital abortions. Thus, residents of fewer counties died from nonhospital abortions in Georgia during the last five-year period than in either of the earlier five-year periods. In spite of the general decline in the number and distribution of abortion deaths, metropolitan Atlanta recorded 11, 10, and 8 nonhospital abortion deaths during each of the last three five-year periods (Table 6). Therefore, the proportion of nonhospital abortion deaths in Georgia, which occurred to residents of Atlanta, increased from 18 to 32 per cent between the last two five-year periods.

Epidemiology of Hospital-Induced Abortions

The cross-hatched counties in Figure 2 are the 49 counties of residence of the 461 women who obtained hospital abortions in Georgia between April 12, 1968, and June 30, 1970. The distribution of these counties suggests that hospital abortions are most available to women residing within 100 miles of metropolitan Atlanta. However, hospital abortion services are even less widely available than indicated by the counties of residence. Although these women lived in 49 of Georgia's counties, abortions were performed in only 22 counties in the two years following passage of the liberalized abortion law. No physician reported performing more than five hospital abortions in either 1968 or 1969. Sixty-three different physicians performed the 73 hospital abortions reported in 1968, and 96 different physicians performed the 168 hospital abortions reported in 1969. In short, about 5 per cent of the practicing physicians[2] in Georgia reported performing abortions in 14 per cent of Georgia's counties during 1968 and 1969.

The number of reported hospital abortions performed in Georgia each month between April, 1968, and June, 1970, is shown in Figure 3. Twenty or fewer abortions were performed monthly until January, 1970, when the number of hospital abortions began to rise, reaching a peak of 47 in June. The number of hospital abortions increased concurrently in five hospitals in three metropolitan areas in Georgia. This increase may have resulted from publicity about a proposed law permitting abortions to be performed during the first 12 weeks of gestation at the discretion of the physician and his pregnant patient. This law was introduced in the Georgia legislature in January, 1970, but was tabled during the legislative hearings.

The number of hospital abortions per 1,000 live births by age and ethnic group is shown in Table 7. The black abortion ratio is less than one-third that of white women. The median age is 25 for the two-year period, but declined from 28.0 to 24.8 between 1968 and 1970. The abortion ratio is highest for women under age 15; this reflects the high proportion of pregnancies in this age group aborted for the indication of rape. The abortion ratio is also high for women over age 34. In 1968-1969, this was due to the large proportion of abortions in this age group performed for maternal physical health indications.

The marital status of women obtaining hospital abortions during 1968-1970

Figure 3—Reported hospital abortions, by month, Georgia, April 1968-June 1970

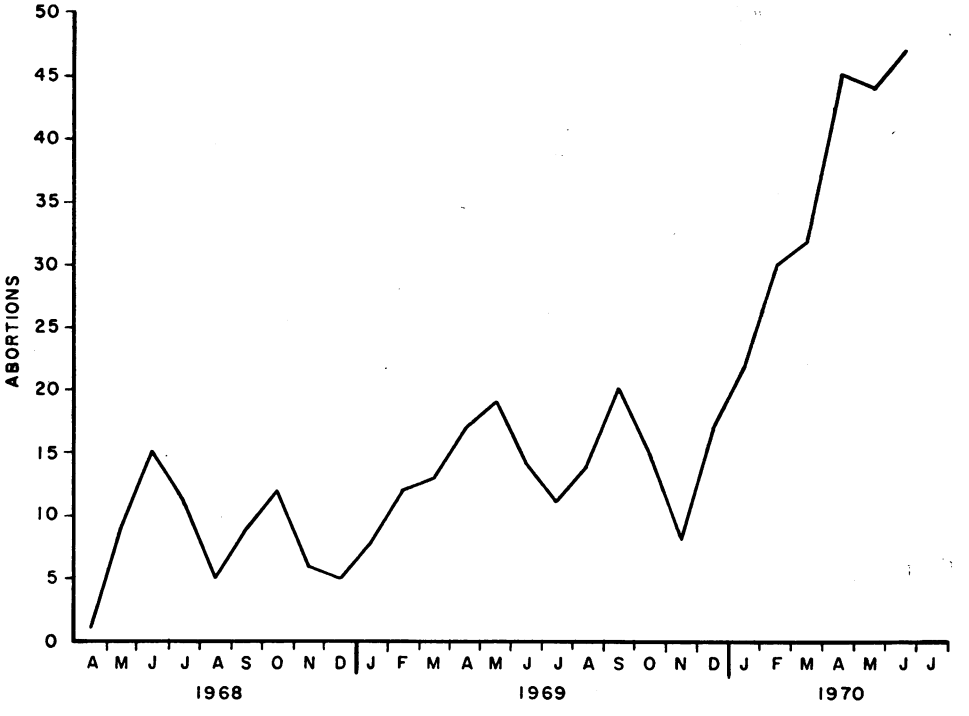


Table 7—Hospital abortions by age and ethnic group, Georgia, 1968-June, 1970

Age	Abortions		Ratio per 1,000 live births	
	White	Black	White	Black
Under 15	11	7	41.5	7.0
15–19	89	9	3.2	0.4
20–24	96	9	1.6	0.4
25–29	99	13	2.6	1.1
30–34	53	7	3.4	1.0
35–39	37	5	6.1	1.4
40 and over	22	3	13.2	2.3
Unknown	1	0	0.0	0.0
Total	408	53	2.7	0.7
Median age	24.9	25.1		

is shown in Table 8. The most striking feature of this table is the relatively high abortion ratio for unmarried whites. Unmarried pregnant whites are 25 times more likely to receive a hospital abortion than unmarried pregnant blacks. The distribution of hospital abortions by order of pregnancy is shown in Table 9. Although most abortions are first pregnancies, the ratio of abortions per 1,000 live births by birth order is highest for the third to the fifth preg-

Table 8—Hospital abortions by ethnic group and marital status,* Georgia, 1968-June, 1970

Yr	Abortions				Ratio/per 1,000 live births			
	White		Black		White		Black	
	M	S	M	S	M	S	M	S
1968	44	25	3	1	0.8	11.8	0.1	0.1
1969	69	78	8	13	1.2	36.3	0.4	1.6
1970†	89	103	12	16	3.0	96.0	1.2	4.0

* Single includes never married, separated, divorced, widowed.

† January-June, 1970, data; ratios calculated using 1969 live birth data.

Table 9—Hospital abortions by order of pregnancy, 1968-June, 1970

Order of pregnancy	Abortions	Abortions per 1,000 live births
First	191	2.6
Second	70	1.4
Third	83	3.1
Fourth	57	4.3
Fifth	35	4.6
Sixth and over	22	1.7
Unknown	3	0.1
Total	461	2.5

nancy while the least frequent is for the second pregnancy.

Georgia's abortion law is based on the American Law Institute Model Penal Code: "A licensed physician is justified in terminating a pregnancy if he believes there is substantial risk that continuance of pregnancy would gravely impair the physical or mental health of the mother or that the child would be born with grave physical or mental defect, or that the pregnancy resulted from rape, incest, or other felonious intercourse. All illicit intercourse with a girl below the age of 16 shall be deemed felonious."[3] However, the Georgia law does not permit physicians to abort pregnancies resulting from incest, and statutory rape is limited to illicit intercourse below age 14.

As shown in Table 10, most women obtained hospital abortions for maternal mental health indications. The proportion of hospital abortions performed for maternal mental health indications nearly doubled between 1968 and the first six months of 1970. Seventy-seven (58%) of the 132 women with maternal mental health indications between 1968-1969 had depressive reactions; 50 expressed suicidal tendencies. An additional 22 (17%) were schizophrenic; six were mentally retarded. Slightly more hospital abortions were performed because of risk of fetal deformity than for maternal physical health indications. Of the 53 abortions performed for fetal indications between 1968-1969, 42 were for rubella infections, 22 of which were confirmed by laboratory tests. Five were indicated because of prior congenital anomalies in siblings, two because of demonstrated congenital anomalies, and four because of irradiation or teratogenic drug ingestion early in pregnancy. Rape accounted for less than 5 per cent of the hospital abortions.

The median length gestation for all pregnancies terminated in hospitals remained at 10.4 weeks during the years 1968-1970. While the median length gestation declined from 11.5 to 10.4 weeks for pregnancies terminated for maternal mental health indications, it increased for maternal physical health reasons from 10.9 to 11.4 weeks, for risk

Table 10—Hospital abortions by indication, Georgia, 1968-June, 1970

Indication	Median age	1968		1969		1970	
		No.	%	No.	%	No.	%
Maternal mental health	23.8	29	*39.7*	105	*62.5*	169	*76.8*
Maternal physical health	29.4	19	*26.0*	24	*14.3*	22	*10.0*
Risk of fetal deformity	26.1	22	*30.1*	30	*17.9*	20	*9.1*
Rape	15.1	3	*4.1*	9	*5.4*	9	*4.1*
Total	24.9	73	*100.0*	168	*100.0*	220	*100.0*

of fetal deformity from 8.0 to 9.8 weeks, and for rape from 9.5 to 11.5 weeks.

Discussion

To summarize nonhospital abortion mortality trends in Georgia, we have observed that mortality has declined among whites and married black women, but has remained high for unmarried black women. That residents of widely separated areas in the state of Georgia died from nonhospital abortions indicates that abortion has probably been used thoughout Georgia as a method of birth control.

The marked decline in mortality between 1960 and 1969 among whites and married black women can be accounted for by one or more of the following reasons:

1. Decreased reporting of abortion deaths.
2. Increased access to unreported and safer abortions since 1965.
3. Improved care of women with medical complications following nonhospital abortions, or
4. Great accessibility of modern contraceptives which may partially reduce the need for abortions.

We do not believe that abortion deaths have been selectively underreported to a greater degree during the past five years than during the previous 15 years. Inasmuch as hospital abortions have been performed so infrequently in Georgia since passage of the 1968 abortion law, we doubt that unreported hospital abortions in Georgia contributed to the recent decline in abortion mortality. A major improvement in the technique of nonhospital abortions, or a large increase in the number of hospital abortions obtained by Georgians in other states, could have resulted in lower abortion mortality in Georgia. Unfortunately, we do not have adequate data to evaluate these hypotheses.

Improved medical care of women with medical complications probably did not reduce nonhospital abortion mortality. Stevenson[4] reported that one-fourth of the 198 women dying from nonhospital abortions in Michigan in the years 1955 to 1964 were dead on arrival at the hospital. A larger study in California[5] showed that 35 per cent were dead on arrival at the hospital and another 42 per cent died within two days. Thus, unless these women can receive medical care sooner following the development of medical complications, improvement in medical care itself can reduce mortality for only a small proportion of these women. Therefore, increased availability of contraceptives is the most tenable explanation for the decline in nonhospital abortion mortality.

Oral contraceptives became available in 1960 and, according to the National Fertility Study,[6] had become "a major means of regulating fertility" among married women in the USA by 1965. A statewide public family planning program was initiated in Georgia in 1965. Public contraceptive services have been provided primarily to the poor women of Atlanta[8] and middle Georgia,[9] which means chiefly black women. Since married white women showed the greatest decline in abortion mortality, private rather than public contraceptive services probably contributed most to the mortality decline.

That deaths due to nonhospital abortions have been reduced essentially to zero for white women indicates that abortion mortality can be eliminated in Georgia. The continuous high abortion mortality for unmarried black women suggests that these women need and desire birth control, but do not receive adequate contraceptive and safe abortion services. We cannot determine from nonhospital abortion mortality the extent to which nonhospital abortion is used for birth control nor its associated morbidity. Nevertheless, the geographic distribution of women dying from abortion indicates areas which need im-

proved contraceptive and/or safer abortion services. Although contraceptive services are available for most women in Atlanta and although 239 (52%) of the hospital abortions in Georgia were performed on Atlanta residents over the past two years, the fact that eight Atlanta women died from nonhospital abortion during the past five years suggests that these contraceptive and abortion services have not sufficed to reduce abortion mortality in that city.

If hospital abortions are intended to reduce nonhospital abortion mortality, they must be conveniently available to all women who would otherwise obtain unsafe nonhospital abortions. However, hospital abortions have been provided primarily to unmarried white women who obtain 25 times as many hospital abortions per 1,000 live births as unmarried black women. Most of these abortions are first pregnancies, performed after a median length gestation of 10.4 weeks. The increased median length gestation during the past two years for abortions not indicated for maternal mental health may suggest decreased availability of convenient abortion services.

Women under 15 and over 34 received the highest proportion of hospital abortions per 1,000 live births. The most common indication for the younger women was rape; for the older women it was maternal physical health. If these women had sought to terminate pregnancies for socioeconomic reasons, rather than those provided by law, they would have obtained them more readily from nonhospital sources or in other states or countries.

Hospital abortions have been performed in only one-seventh of Georgia's counties in the past two years. To reduce nonhospital abortion mortality, hospital abortions must become available throughout Georgia. Administrative and consultative barriers to service must be eliminated, especially for communities which consider themselves fortunate if they have a single physician.

A comparison of hospital abortion ratios in several states, which have reported hospital abortions following recent liberalization of abortion laws, shows that in proportion to live births markedly fewer hospital abortions have been performed in Georgia than in these other states.[10] While the 1969 hospital abortion ratio in Georgia was two abortions per 1,000 live births, four states reported hospital abortion ratios of 25 or greater: California, 35; Colorado, 25; Maryland, 31; and Oregon, 41.[11]

Finally, although the number of hospital abortions doubled during the first six months of 1970, they may be expected to continue to rise, partly as a result of a July, 1970, Federal Court decision in Atlanta which declared: "The Court agrees that the breadth of the right to privacy encompasses the decision to terminate an unwanted pregnancy" and ". . . the state may not unduly limit the reasons for which a woman seeks an abortion."[12]

Summary

In conclusion, then, the ethnic group, marital status, age, and geographic distribution of women dying from nonhospital abortions in Georgia differs from that of women obtaining hospital abortions. Maternal mental health indications are more restrictively defined by the medical community in Georgia than in other states with similar laws. And, finally, mortality from nonhospital abortions for unmarried black women in Georgia will be reduced only if contraceptive, abortion, and other maternal health services are provided more equitably to all women in need of such services.

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